CLAIMS

What is claimed is:

1. An acoustical absorber comprising:

    a. a first synthetic polymeric scrim layer,

    b. a first synthetic polymeric film layer,

    c. an interior fibrous batt layer,

    d. a second synthetic polymeric film layer, and

    e. a second synthetic polymer scrim layer,

wherein

i. the first synthetic polymeric scrim layer has interstices and has a melting point higher than that of the first synthetic polymeric film layer, and the first film fills some of the interstices of the first scrim, resulting in an embedded first scrim/first film combination,

ii. the second synthetic polymeric scrim layer has interstices and has a melting point higher than that of the second synthetic polymeric film layer, and the second film fills some of the interstices of the second scrim, resulting in an embedded second scrim/second film combination,

iii. the interior batt layer is adhered to the first film layer and the second film layer, and

iv. the acoustical absorber is flexible and has an air permeability ranging from about 500 Rayles to about 26,000 Rayles.

2. The acoustical absorber according to claim 1, wherein the batt comprises a fiber selected from the group consisting of woven fiber, non-woven fiber, and combinations thereof.

3. The acoustical absorber according to claim 1, wherein the batt comprises a fiber selected from the group consisting of natural fiber, synthetic fiber, and combinations thereof.

4. The acoustical absorber according to claim 3, wherein the batt comprises:

about 50 % or more by weight natural fiber, and

about 50 % or less by weight synthetic fiber.

5. The acoustical absorber according to claim 4, wherein the batt comprises:

about 60% to about 90 % by weight natural fiber, and

about 10 % to about 40 % by weight synthetic fiber.

6. The acoustical absorber according to claim 3, wherein the natural fiber of the batt comprises a fiber selected from the group consisting of cotton, wool, flax, jute, mohair, silk, ramie, hemp, asbestos, and combinations thereof.

7. The acoustical absorber according to claim 3, wherein the synthetic fiber of the batt comprises a fiber selected from the group consisting of rayon, acetate, nylon, polyester, polypropylene, polyethylene, acrylic, vinyl, and combinations thereof.

8. The acoustical absorber according to claim 1, wherein the batt comprises a material that has a density of about 3 pounds per cubic foot or less.

9. The acoustical absorber according to claim 1, wherein the first synthetic polymeric film layer and the second synthetic polymeric film layer comprise a same or a different synthetic polymer, and the synthetic polymer is selected from the group consisting of high density polyethylene, medium density polyethylene, low density polyethylene, linear low density polyethylene, very low density linear polyethylene, ultra low density polyethylene, polypropylene, polyester, ethylene vinyl acetate copolymer, nylon, and combinations thereof.

10. The acoustical absorber according to claim 1, wherein the first synthetic polymeric scrim layer and the second synthetic polymeric scrim layer comprise a same or a different synthetic polymer, and the synthetic polymer is selected from the group consisting of high density polyethylene, medium density polyethylene, low density polyethylene, linear low density polyethylene, very low density linear polyethylene, ultra low density polyethylene, polypropylene, polyester, ethylene vinyl acetate copolymer, nylon, and combinations thereof.

11. The acoustical absorber according to claim 1, wherein the absorber recovers at least about 80 % of its precompression volume after a compressive force is removed.

12. The acoustical absorber according to claim 1, wherein the absorber has an air permeability ranging from about 1000 Rayles to about 25,000 Rayles.

13. An acoustical absorber comprising:

a. a first scrim layer comprising polypropylene,

b. a first film layer comprising linear low density polyethylene,

c. an interior batt layer comprising a non-woven material having about 60 % to about 90 % by weight cotton fiber and about 10 % to about 40 % by weight polyester fiber,

d. a second film layer comprising linear low density polyethylene, and

e. a second scrim layer comprising polypropylene,

wherein

i. the first scrim layer has interstices, and the first film fills some of the interstices of the first scrim, resulting in an embedded first scrim/first film combination,

ii. the second scrim layer has interstices, and the second film fills some of the interstices of the second scrim, resulting in an embedded second scrim/second film combination,

iii. the interior batt layer is adhered to the first film layer and the second film layer, and

iv. the acoustical absorber is flexible, recovers at least about 80 % of its precompression volume of after a compressive force is removed, and has an air permeability ranging from about 500 Rayles to about 26,000 Rayles.

14. A method for acoustically insulating a structure, the method comprising the steps of:

A. providing an acoustical absorber comprising:

a. a first synthetic polymeric scrim layer,

b. a first synthetic polymeric film layer,

c. an interior fibrous batt layer,

d. a second synthetic polymeric film layer, and

e. a second synthetic polymer scrim layer,

wherein

i. the first synthetic polymeric scrim layer has interstices and has a melting point higher than that of the first synthetic polymeric film layer, and the first film fills some of the interstices of the first scrim, resulting in an embedded first scrim/first film combination,

ii. the second synthetic polymeric scrim layer has interstices and has a melting point higher than that of the second synthetic polymeric film layer, and the second film fills some of the interstices of the second scrim, resulting in an embedded second scrim/second film combination,

iii. the interior batt layer is adhered to the first film layer and the second film layer, and

iv. the acoustical absorber is flexible and has an air permeability ranging from about 500 Rayles to about 26,000 Rayles,

and

B. installing the acoustical absorber in a void of the structure.

15. The method according to claim 14, wherein the structure comprises a motor vehicle or a building.

16. The method according to claim 14, the method further comprising the steps of:

compressing the acoustical absorber to less than the volume the acoustical absorber occupied before compression prior to installing the acoustical absorber,

and

releasing the acoustical absorber from compression following the installing step for allowing the acoustical absorber to recover to fill the void.

17. The method according to claim 16, wherein the structure comprises a motor vehicle or a building.

18. The method according to claim 14, wherein the absorber has an air permeability ranging from about 1000 Rayles to about 25,000 Rayles.

19. A method for making an acoustical absorber, the method comprising the steps of:

A. placing in contact a flexible synthetic polymeric film sheet and a flexible synthetic polymeric scrim sheet, wherein the scrim sheet has interstices and has a melting point higher than that of the film sheet,

B. heating the scrim sheet and the film sheet so that the film sheet fills some of the interstices of the scrim sheet, resulting in an embedded scrim/film combination,

C. sandwiching a fibrous batt sheet between two pieces of the embedded scrim/film combination, with the film side of the scrim/film combination adjacent the batt sheet,

D. heating the sandwich of scrim/film/fibrous batt/film/scrim to adhere the film to the fibrous batt,

and

E. obtaining a flexible acoustical absorber having an air permeability ranging from about 500 Rayles to about 26,000 Rayles.

20. The method according to claim 19, wherein the batt comprises a fiber selected from the group consisting of natural fiber, synthetic fiber, and combinations thereof.

21. The method according to claim 19, wherein the two synthetic polymeric film sheets comprise a same or a different synthetic polymer, and the synthetic polymer is selected from the group consisting of high density polyethylene, medium density polyethylene, low density polyethylene, linear low density polyethylene, very low density linear polyethylene, ultra low density polyethylene, polypropylene, polyester, ethylene vinyl acetate copolymer, nylon, and combinations thereof.

22. The method according to claim 19, wherein the two synthetic polymeric scrim sheets comprise a same or a different synthetic polymer, and the synthetic polymer is selected from the group consisting of high density polyethylene, medium density polyethylene, low density polyethylene, linear low density polyethylene, very low density linear polyethylene, ultra low density polyethylene, polypropylene, polyester, ethylene vinyl acetate copolymer, nylon, and combinations thereof.

23. The method according to claim 19, wherein the absorber recovers at least about 80 % of its precompression volume after a compressive force is removed.

24. The method according to claim 19, wherein the absorber has an air permeability ranging from about 1000 Rayles to about 25,000 Rayles.

25. The method according to claim 19, wherein the film sheets, the scrim sheets, and the batt sheet are placed together in a sandwich of scrim/film/fibrous batt/film/scrim and heated simultaneously to obtain the acoustical absorber.

26. The method according to claim 25, wherein the absorber recovers at least about 80 % of its precompression volume after a compressive force is removed.

27. The method according to claim 25, wherein the absorber has an air permeability ranging from about 1000 Rayles to about 25,000 Rayles.